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URBAN RIPARIAN RESTORATION: AN OUTDOOR CLASSROOM FOR COLLEGE AND HIGH SCHOOL STUDENTS COLLABORATING IN CONSERVATION

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ABSTRACT

Despite the biological, social, and physical challenges that exist in urban creek restorations, there are opportunities to effectively involve local residents in ecological rehabilitation projects. An urban riparian restoration project along Strawberry Creek (Berkeley, CA) began with the goal of removing exotic vegetation and restoring native plant coverage. However, through the involvement of local high school and college students, the project accomplished an additional goal of educating the local community about restoration and conservation. Undergraduate students at the University of California, Berkeley conducted pre-restoration vegetation surveys of species richness and cover in order to assess initial species composition at the restoration site. Berkeley High School students, under the guidance of UC Berkeley graduate student mentors, removed exotic vegetation from an 800 m^2 area of the riparian zone and replaced exotics with over 500 individual native plants. Post-restoration vegetation surveys found that this project succeeded in reducing the cover of exotic vegetation and increasing native species richness. A smaller area adjacent to the student plantings was more intensively maintained by the University of California, Berkeley Office of Environment, Health & Safety and had a higher survival rate among the natives planted. Student attitudinal surveys indicated that students' involvement in the restoration activities increased their awareness and appreciation of the creek's value and educated them about scientific concepts of restoration and conservation. In spite of the various challenges of coordinating several interest groups, the involvement of local students has the potential to increase the likelihood that the project will succeed in the long term, especially if such involvement signals greater appreciation for the creek habitat.

Key Words: exotic vegetation removal, riparian, restoration, students, urban.

Urban creeks present tremendous challenges in efforts to reduce exotic riparian vegetation and maintain native biodiversity. Some of the challenges associated with restoring urban areas include: high frequency of disturbance, hydrologic alterations, exotic plants used in landscaping, bank erosion, increased levels of nutrients, and the presence of pollutants in runoff and litter (Walsh et al. 2005; Paul and Meyer 2001). Another challenge in urban restoration is the potential for negative public opinion towards the project, such as concerns about poor aesthetics, decreased safety, or a perception that the landscape appears to be too "wild" (Schroeder 1982; Gobster 1999; Bright et al. 2002). Such negative opinions can hamper the support for, and implementation of, a restoration project.

Despite the challenges involved in urban creek restorations, there are many opportunities to successfully achieve important conservation goals (Kondolf 1998). The high visibility and proximity of urban creeks to local residents can serve the vital purpose of encouraging conservation and restoration (Riley 1998). Furthermore, the involvement of local citizens, particularly students, can educate the local community about the benefits of riparian restoration and lead to improved attitudes towards restoration and conservation (Purcell et al. 2002). However, building local interest and involving amateur conservationists can be time-consuming, complicate the planning process, and affect the scope and intensity of a project (Morris and Moses 1999).

This study explores several elements involved in a riparian restoration project along Strawberry Creek in Berkeley, California. The objectives of this study were to: (1) compare pre- and post-

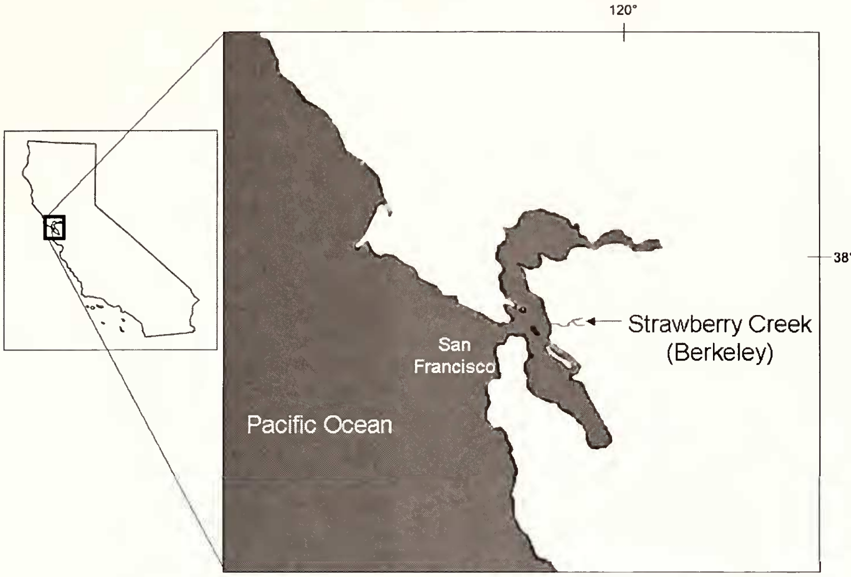

FIG. 1. Location map of the Strawberry Creek in Berkeley, California.

restoration vegetative cover (native versus exotic) at the restoration site, (2) evaluate the benefits and challenges of involving local students in the restoration project, and (3) examine the advantages and disadvantages of planning and implementing the restoration project through a collaboration involving several interest groups.

METHODS

Site Description. Strawberry Creek (37°52′N; 122°15′W) is located in Berkeley, California (Alameda County, USA) (Fig. 1). The Strawberry Creek watershed (4.7 km^2) is composed of two major branches: the north and south forks, which run in open channels through the University of California, Berkeley (UC Berkeley) campus (Charbonneau and Resh 1992) (Fig. 2). Downstream of the UC Berkeley campus, Strawberry Creek is primarily in underground culverts through the city of Berkeley until it discharges into the San Francisco Bay. While the upper Strawberry Creek watershed (Strawberry and Blackberry canyons) is composed largely of relatively undisturbed vegetation and intact riparian zones, the downstream watershed is urbanized with high levels of impervious surface including concrete and other channel alterations.

The restoration site is located at the very downstream end of the UC Berkeley campus just before Strawberry Creek runs into an underground culvert (Fig. 3). This area is known as the "Grinnell Natural Area" (named after the famous Berkeley naturalist Joseph Grinnell) and is relatively less developed compared to the rest of the campus. Despite its designation, the vegetation in this area is heavily dominated by exotic plant species including *Vinca major* (blue periwinkle), *Hedera helix* (English ivy), and *Eucalyptus globulus* (blue gum) (Nomenclature follows Hickman 1993.)

Previous restoration projects on Strawberry Creek include a management plan in 1987 that focused on improving water quality and reducing erosion and downcutting in the channel (Charbonneau 2000). Instream water quality was improved by eliminating direct discharges or cross-connections of the sanitary sewer system into the creek. Bank erosion and channel downcutting were addressed by implementing several erosion-control measures including the installation of a redwood cribwall and check-dams to reduce channel incision (Charbonneau and Resh 1992).

Project Description. The Strawberry Creek restoration (hereafter referred to as restoration project) was a native plant revegetation project in which the goals were to remove exotic vegetation in the riparian corridor, increase abundance and diversity of native species, and incorporate an educational component through the participation of local high school and college students.

Several steps were involved in the restoration project (an overview is presented in Table 1). A small planning committee met periodically to coordinate the organizational and logistical aspects of the project. Members of this committee represented several interest groups within UC Berkeley including staff, faculty, and students.

In March 2005, UC Berkeley graduate students involved in the Berkeley Natural History Museums' "Exploring California Biodiversity" project (funded by the National Science Foundation's GK-12 program) worked with an

FIG. 2. Aerial photograph of the upper Strawberry Creek watershed as it runs through the University of California, Berkeley campus (white line represents segments of creek that are above ground). The restoration site is located at the downstream end of the campus on the left bank of Strawberry Creek.

undergraduate plant ecology course at UC Berkeley to conduct initial weeding of the restoration site. The exotic plants removed consisted primarily of *H. helix* and *V. major*. Approximately 95 UC Berkeley students weeded an 800 m^2 area within the Strawberry Creek riparian zone and nearby upland areas within the Grinnell Natural Area. In addition to the initial weeding conducted in March 2005, weeding of exotics was done periodically throughout the project and on all the planting days.

In October 2005, approximately 80 high school students enrolled in an Environmental Science class at Berkeley High School transplanted native seedlings from flats into individual Conetainers® (Stewe and Sons, Corvallis, OR). The Conetainers, 2.5 cm diameter cylindrical cones, were in held in plastic flats (100 Containers per flat) for planting individual seedlings. The six native species planted (*Achillea millefolium*, *Bromus carinatus* (California brome), *Grindelia* sp., *Elymus glaucus* (blue wildrye), *Ranunculus californicus* (California buttercup), and *Aster chilensis*) were donated by a local non-profit organization (The Watershed Project). Once transplanted into the Conetainers, the seedlings were watered regularly until they developed sufficient root mass for planting into the ground.

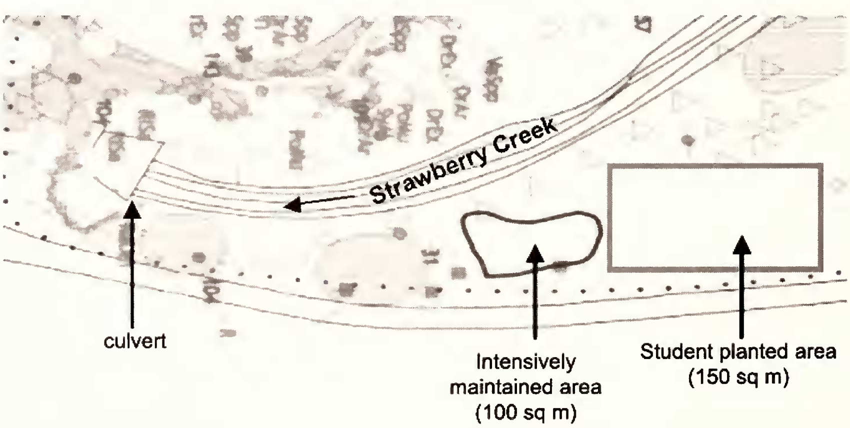

FIG. 3. The two areas of the Strawberry Creek restoration site within the Grinnell Natural Area: 1) an intensively maintained area and 2) a student planted area located on the left bank of Strawberry Creek just before it enters an underground culvert.

TABLE 1. TIMELINE OF TASKS COMPLETED AND GROUPS INVOLVED IN THE STRAWBERRY CREEK RESTORATION PROJECT DURING 2004–06. Abbreviations: BHS = Berkeley High School; EH&S = Office of Environment, Health & Safety; SCB = UC Berkeley chapter of Society for Conservation Biology; UCB = University of California, Berkeley; NSF = National Science Foundation.

Date	Task	Groups involved
2004–06	Periodic planning meetings to arrange logistical and organizational details	UCB faculty, staff (EH&S), graduate, and undergraduate students
2005		
March	Pre-restoration vegetation survey (established baseline conditions)	UCB Plant Ecology class (undergraduate students)
April	Initial weeding of site	UCB Plant Ecology class, BHS students, and NSF GK-12 graduate students
September	Acquired supplies (seeds, seedlings, soil, Conetainers etc.)	EH&S staff, UCB faculty, and graduate students
October	Fall weeding; transplanted seedlings from flats to Conetainers	Local non-profit organization (The Watershed Project), BHS students, and SCB members
Oct–Jan	Watered seedlings and allowed time for sufficient root mass to develop	EH&S staff and UCB graduate students
October	Collected cuttings for rooting, purchased plants from local nursery	EH&S staff and UCB graduate students
Oct/Nov	Installed informational signs and fencing at site	EH&S staff, UCB graduate students, and SCB chapter
2006		
January	Planted native seedlings into the ground	BHS students, EH&S staff, UCB graduate students, and SCB
Mar–June	Periodic spring weeding	EH&S staff, UCB graduate students, and SCB
May/June	Seed collection for fall planting	EH&S staff
June	Post-restoration vegetation survey	Authors (Purcell/Corbin)

In January 2006, approximately 100 high school students (from the same Environmental Science class at Berkeley High School that transplanted the seedlings in October 2005) planted the native seedlings from the Conetainers into the ground when soil moisture levels were adequate for seedling survival without watering. The seedlings were planted in a 150 m^2 "student planting area" (Fig. 3). In order to plant this area, the Berkeley High School students first weeded a circular plot (1-m diameter) and then planted several native seedlings species at evenly spaced intervals within the circular plot. The planted area was roped off to discourage human disturbance of the newly planted seedlings and informational signs were installed to explain the project to the public.

In contrast to the student planted area, a few staff members of UC Berkeley's Office of Environment, Health & Safety (EH&S) worked on an "intensively maintained area" (Fig. 3). Larger, more mature plants in 10 cm to 4 L pots were planted in this smaller area (100 m^2) and received more frequent maintenance (i.e., weeding, mulching, and watering). Approximately 300 individual plants consisting of 46 species were planted in the "intensively maintained area" (Table 2).

Vegetation Cover. In order to compare the vegetation cover before and after the restoration, species composition was sampled in the intensively maintained area in March 2005 (prior to removal of exotic species) and June 2006 (six months after replanting natives). At each sampling time, one 10 m transect was established perpendicular to the stream channel from the edge of stream. The transect included the riparian area near the stream bank and extended out to the edge of the restored area. Presence and percent cover of all plant species within a 0.25 m^2 quadrat was recorded every 0.5 m along the transect. Cover was estimated using cover classes (0–2, 2–5, 5–10, 10–25, 25–50, 50–75, and 75–100%). The numbers of exotic and native plant species in the 2005 (pre-restoration) and 2006 (post-restoration) were compared using ANOVA (SAS 2000).

Berkeley High School students in the Environmental Science class mapped the location and species of each seedling planted in January 2006 using graph paper to maintain a consistent scale. Landmarks such as fences and trees were documented to determine the proximity of the planting circles to specific features at the site. These maps were used to determine survival rates of the student planting area by comparing the initial maps with the surviving plants in June 2006.

Student and Leader Surveys. In order to gauge the educational and attitudinal impacts of involving students in the restoration project, a survey was given to 69 of the approximately 100 Berkeley High School students in the Environmental Science class who participated in restoration activities during 2005–06. The student

TABLE 2. NATIVE SPECIES PLANTED AT STRAWBERRY CREEK RESTORATION SITE.

Scientific Name	Common Name	Potted Plants	Conetainer Seedlings
Grasses, sedges, and rushes			
Agrostis pallens	Bent grass	7	
Bromus carinatus var. carinatus	Brome, California		100
Carex obnupta	Slough sedge	3	
Carex praegracilis	Deer-bed sedge	13	
Elymus glaucus ssp. *glaucus*	Blue wild rye	7	100
Elymus trachycaulus (RFS)	Slender wheatgrass	6	
Festuca californica	California fescue	1	
Hordeum brachyantherum	California meadow barley	4	
Juncus balticus	Baltic wire rush	4	
Juncus patens	Spreading rush	5	
Koeleria macrantha	June grass	1	
Melica californica	California melic grass	10	
Nassella lepida	Foothill needle grass	10	
Nassella pulchra	Purple needle grass	10	
Forbs and shrubs			
Achillea millefolium	Yarrow		100
Aristolochia californica	California pipevine	5	
Aster chilensis	California aster		100
Baccharis pilularis	Coyote bush	3	
Chlorogalum pomeridianum var. pomeridianum	Soap Plant	36	
Delphinium californicum	California delphinium	8	
Escholtzia californica	California poppy	1	
Fragaria vesca	Woodland strawberry	10	
Gnaphalium palustre	Western marsh cudweed	2	
Grindelia hirsutula var. hirsutula	Hairy gumplant	14	50
Helenium puberulum	Rosilla, Sneezeweed	16	
Heracleum lanatum	Cow parsnip	2	
Heuchera micrantha	Alumroot	10	
Iris douglasiana	Douglas iris	19	
Lonicera hispidula	Honeysuckle	20	
Lotus scoparius var. scoparius	Deerweed	2	
Lupinus sp.	Lupine	7	
Mimulus guttatus	Yellow monkey flower	2	
Physocarpus capitatus	Ninebark	2	
Prunella vulgaris	Common selfheal	4	
Ranunculus californica	California buttercup		50
Rhamnus californica ssp. *californica*	Coffeeberry	2	
Ribes menziesii	Canyon gooseberry	3	
Ribes sanguineum var. glutinosum	Red-flowered currant	3	
Prubus parviflorus	Thimbleberry	1	
Scrophularia californica ssp. *californica*	California Figwort, Beeplant	11	
Sisyrinchium bellum	Blue-eyed grass	1	
Stachys ajugoides var. rigida	Hedge Nettle	3	
Symphoricarpos albus	Snowberry, Bush	3	
Tellima grandiflora	Fringe cups	13	
Veronica americana	American brooklime	10	
TOTAL	46 species	294	500

survey consisted of six questions in which students were asked to evaluate what they learned and their resulting attitude towards the creek and restoration (Appendix I).

A survey was also given to a variety of individuals involved in planning, coordinating, and leading the Strawberry Creek restoration activities in order to evaluate their overall impression of the restoration. Questions focused on their involvement in the project, the motivation that kept them involved over time, challenges that arose, and whether the project had been a success (Appendix II). The leader survey also asked respondents to list the positive and negative aspects of the collaborative nature of the project.

RESULTS

Vegetation Cover. In March 2005, the plant community in the pre-restoration vegetation

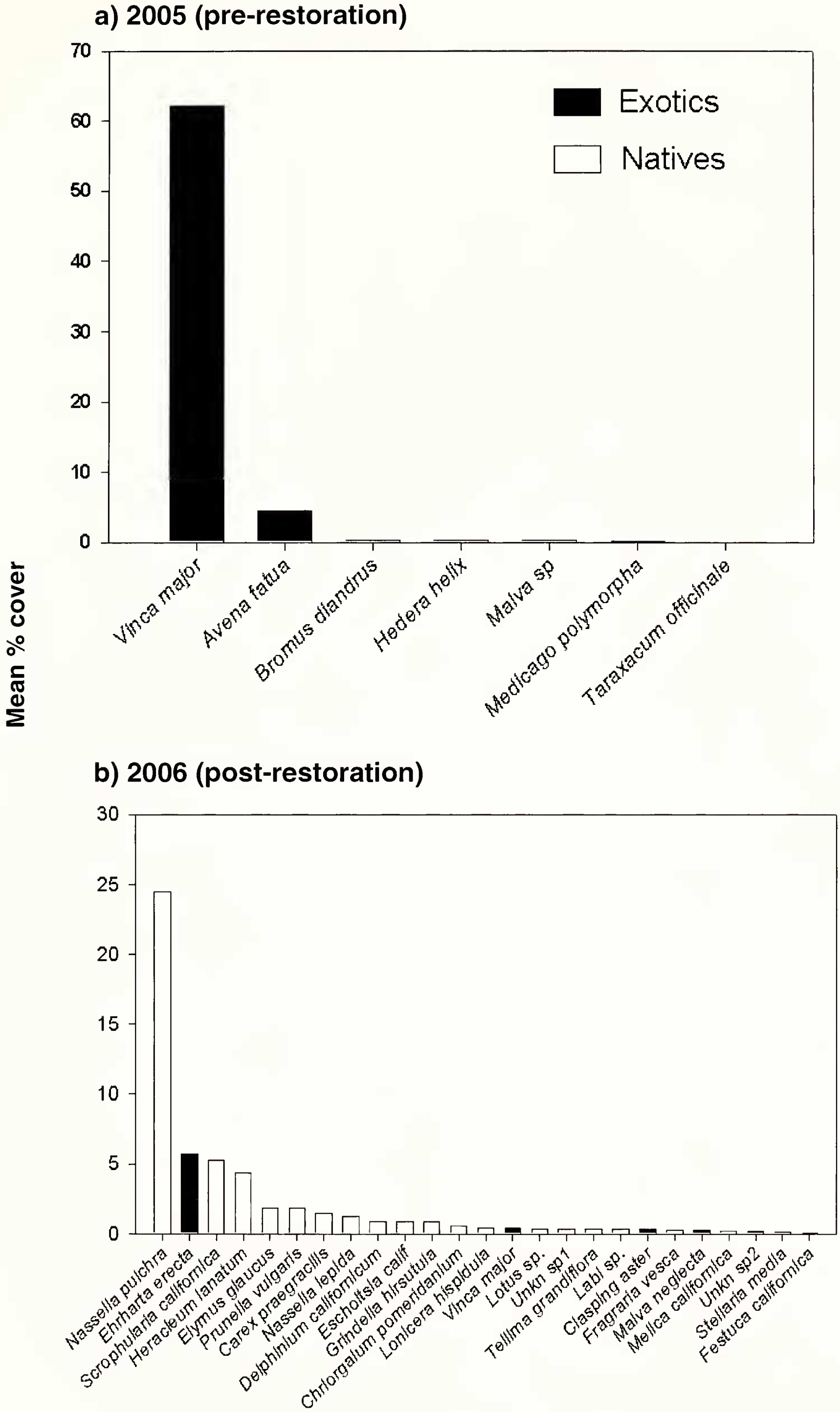

FIG. 4. Mean percent cover of species in 0.25 m^2 quadrats sampled along 10 m transects in: a) 2005 (pre-restoration) and b) 2006 (post-restoration). All species in Fig. 4a are exotics. Note the difference in scale between the two graphs.

survey was dominated by the exotic species *V. major* (mean cover = 62%) and no native species were recorded (Fig. 4a). *Vinca major* was the only species with a percent cover that exceeded 5% along the transect. Seven species were recorded along the entire transect; the average species richness in each quadrat was 2.0 (SE = 0.4) species 0.25 m^{-2}.

TABLE 3. SURVIVAL OF STUDENT PLANTINGS.

Scientific Name	Common Name	Survival rate
Achillea millefolium	Yarrow	71%
Grindelia sp.	Gum plant	35%
Elymus glaucus	Blue wild rye	28%
Aster chilensis	Aster	9%
Bromus carinatus	California brome	8%
Ranunculus californicus	California buttercup	0%
	Total Overall Survival:	30%

Following removal of *V. major* and subsequent planting of native species, species composition and prevalence of native species changed dramatically. In the post-restoration vegetation survey (June 2006), *V. major* was observed in only 5 of 20 points along the transect, and its cover was never greater than 2% (Fig. 4b). The richness of native species increased significantly post-restoration; 19 native species were recorded along the transect, with a mean native richness of 1.7 species 0.25 m^{-2} (SE = 0.3; significant difference in native species richness between pre- and post-restoration: $F_{1,28} = 13.2$, $p < 0.002$). Post-restoration mean native cover increased to 23.5% (SE = 6.1) per 0.25 m^2, while cover of exotics was reduced to 6.2% (SE = 4.3). The difference between pre- and post-restoration native cover was also statistically significant ($F_{1,38} = 2.0$, $p < 0.05$).

The survival of the student plantings was highly variable depending on the species (Table 3). For example, *A. millefolium* had a survival rate of 71%, yet none of the *R. californicus* survived. The overall survival rate of the student plantings was fairly low (30%) compared to the much higher survival rate of the "intensively maintained area" (~90%). Approximately 30 mature potted plants were planted in the "student planting area" and had a higher survival rate compared to the smaller Conetainer seedlings.

Student and Leader Surveys. The results of the student survey (n = 69) provided some insight on how much the students learned and their attitude toward stream restoration after their involvement in the restoration project. When asked: "What was the overall goal of the Strawberry Creek Restoration?" 91% of students were able to accurately state the goal of the restoration in their own words. When students were given a series of words to choose from that described their experience working on the restoration (i.e., fun, educational, boring, pointless) 49% of students responded that it was fun, 57% responded that it was educational, while only 32% responded that it was boring, and 12% responded that it was pointless. In addition, 55% of students remarked that working on the restoration project had a positive influence on their attitude towards the creek, such as an increase in awareness or appreciation of the creek. Lastly, when students were asked: "Do you think you'd be interested in working on stream restoration projects in the future?" 42% of respondents answered "yes" or "maybe."

When project leaders were asked about the advantages and disadvantages of the collaborative nature of this project, the common advantages listed were: (1) the educational aspect of involving students, (2) the committed leadership with a large breadth of expertise that shared responsibility, and (3) the cost effectiveness of using volunteers and donated materials. Some disadvantages mentioned were: (1) uneven enthusiasm from Berkeley High students, (2) quality control of plantings, and (3) difficulty of coordinating everyone's schedule. Overall, the positive aspects of the collaboration were mentioned more often than the negative aspects.

DISCUSSION

Restoration of Native Plant Biodiversity. The results of the pre- and post-restoration vegetation surveys indicated that the restoration project goals to remove exotics and replant natives were successfully achieved. The goal to remove exotic species was achieved through manual removal of the exotic plant species in the restoration area and was sustained over a one-year period (*V. major* cover decreased from 62% in 2005 to 1% in 2006). Mulching around the native plants also reduced the number of exotics that reemerged. The goal to replant the restoration area with native species was successfully achieved in both the student planting and the intensively maintained area with survival rate varying by plant species and level of maintenance.

The two restoration areas (student planted and the intensively maintained) varied in the effort to establish native species. The student plantings were completed at little to no cost (e.g., volunteer labor, donated supplies, no transportation costs—walking distance from high school campus) and covered a larger area (150 m^2). The low survival rate (30%) of the student plantings may be attributed to the small size of the seedlings planted and the low frequency of weeding and other maintenance over the spring season. Weeding and maintenance are known factors that influence the survival of plantings in restoration projects (e.g., Washitani 2001). During March and April of 2006, the small plants in the student planted area were rapidly outcompeted by exotic weeds such as *Malva neglecta* (common mallow), *Stellaria media* (common chickweed), *Hordeum murinum* (hare barley), *Avena fatua* (wild oat), *Medicago polymorpha* (California burclover), and *Ehrharta erecta* (panic veldt grass). A few larger potted plants in the student planted area had a higher survival rate and were easier to locate during maintenance weeding. In contrast, the smaller intensively maintained area (100 m^2) was completed at a higher cost (~\$1500), but had higher survival rates among the native plantings (~90%). The reasons behind this success may be attributed to the larger size of the seedlings planted and higher frequency of weeding. A mulch path was also installed to prevent trampling of the native plants. Overall, a higher level of care and cost led to increased plant survival and a more aesthetically pleasing result.

The tradeoffs between cost, plant survivorship, aesthetics, and public involvement were important considerations in this project, as has been reported in other studies (e.g., Morris and Moses 1999). The competing goals of maximizing establishment of native species compared to keeping costs low required tradeoffs, but we believe that there were benefits of adopting both strategies within a single project. The intensively maintained area served as a "showcase" area with large native plants and low return of exotic plants. In contrast, the student planting area served an educational (and experimental) purpose while covering a larger area. Both purposes were of equal importance to this project.

Previous restoration projects have found that follow-up work is needed to ensure long-term success of a restoration project (e.g., Davies and Christie 2001). Higgs (1997) emphasized that in order for a restoration project to be successful it must exhibit durability (ability to persist for a long period). It has been suggested that a timescale of 15–20 yr is often a suitable timeline for evaluating the success of a restoration project (Mitsch and Wilson 1996). Therefore, despite the drastic decrease of exotic species abundance and cover at the restoration site during the first year, active management (such as weeding and mulching) will certainly be needed to prevent reinvasion of exotic species in the future (Berger 1993; Davies and Christie 2001; Washitani 2001). The urban location of the restoration site makes it more susceptible to reinvasion because of the large source of exotic propagules in surrounding areas. Active management of this project in the future will consist of manual weeding of exotics, additional planting of natives, and mulching around the native plants. EH&S staff are coordinating with Berkeley High School staff and student groups at UC Berkeley to carry out these efforts over the next few years.

During the winter of 2006–07, a second phase of restoration was completed with the primary goal of establishing native vegetation cover in the 2005–06 student planting area that had poor survival in the previous year. The methodology for 2006–07 plantings was equivalent to the previous year with a few modifications made based on the findings of the first phase of planting. The modifications included using larger four inch containers rather than Conetainers for September transplants by Berkeley High School students and intensive weeding in March and April 2007 by University staff and volunteers from a local creek restoration group (Friends of Five Creeks). The second phase of planting was accomplished with the assistance of approximately 100 Berkeley High School students in an Environmental Science class and 30 students from Kensington Hilltop Elementary School. As of June 2007, the results appear to be satisfactory with high plant survival in the student planting area.

Restoration as an Educational and Collaborative Exercise. The goal to incorporate an educational component in the restoration project was also successfully achieved through the involvement of local students from Berkeley High School. The students learned several scientific concepts from their involvement in the project including the importance of native biodiversity, differences between native and exotic species, and principles of ecology, plant physiology, and restoration science. An overview of these topics was introduced to the students at the beginning of each restoration activity to provide an educational context. Several of these topics were in agreement with the California State Board of Education Science Content Standards (California State Board of Education 2006). Students not only learned educational concepts, but also received hands-on experience in native plant restoration such as transplanting, weeding, planting, mulching, mapping, and determining where to plant each native species within the riparian zone.

While the initial purpose of involving students was purely educational, there were some other unexpected outcomes. In particular, it was compelling to see that 42% of students responded they were interested in working on restoration projects in the future. This suggests that involving students in restoration projects can serve not only an educational purpose, but can also inspire individuals to volunteer for other restoration projects in the future or perhaps even pursue careers in fields such as conservation biology, environmental science, or restoration ecology.

When considering the advantages and disadvantages of the collaborative nature of this restoration project, those involved in the leadership of the restoration project responded that strong and dynamic leadership was the key to a successful collaboration. The individuals involved in the planning and implementation of this project were motivated and committed to stay involved throughout the duration of the project and their breadth of experience resulted in a group dynamic where no single person was solely responsible for getting the work done. Many of the leaders remarked that their passion for working with youth and environmental education kept them motivated, inspired, and involved in the project over the long-term.

Additional positive outcomes of the collaborative planning process were the connections formed between the many groups that worked on this project and the links to the community. The relationship established between the EH&S staff and the Berkeley High School teacher will ensure student involvement in the future. Interpretive signs describing the goals and progress of the project provided a link to the community to keep people informed of the changes occurring at the site. The student planting days were featured in the local news and the UC Berkeley campus website, furthering the connection between the University and the community. Ongoing updates and news about the restoration were made available online (University of California Berkeley 2006).

This project was also useful as a model of a restored ecosystem on the UC Berkeley campus and should serve to inspire future projects. The flowering and seed production of several planted native species in the spring of 2006 was an indication that the site may be able to sustain a new native plant community in the long term. However, weeding and maintenance over time will be crucial to keep the exotics from reinvading the site (Washitani 2001).

Recommendations. Upon reflection of the lessons gleaned from this project, we propose a series of recommendations for urban stream restoration projects. As mentioned previously, motivated and committed leadership was crucial for a successful collaboration and allowed the project to continue and flourish over time. Thus, we recommend that similar projects have at least one or two committed leaders who will oversee the other collaborators. Second, successful incorporation of students into restoration projects requires the enthusiastic participation of a classroom teacher who is willing to incorporate the restoration into their class' curriculum. Third, seed money and/or institutional support is required to acquire supplies (e.g., plants, potting soil, Conetainers) and maximize the efficiency of volunteer labor. Lastly, site location should take into account the proximity of the project to likely volunteers, to increase both numbers of volunteers and also participants' appreciation of the site. We hope that the lessons learned from this project can serve as a guide for similar restoration projects in urban areas.

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APPENDIX I.
STRAWBERRY CREEK RESTORATION STUDENT SURVEY QUESTIONS

1. What **activities** did you participate in as part of the Strawberry Creek Restoration on the UC Berkeley campus?
2. What was the **overall goal** of the Strawberry Creek Restoration?
3. Working on the Strawberry Creek Restoration was (circle all that apply):

fun educational boring hard work pointless

Other:

Has your attitude towards Strawberry Creek changed since your involvement in the restoration? (circle one)

Y / N

How has your attitude changed?

4. Do you think you'd be interested in working on stream restoration projects in the **future**?

Y / N

Why?

5. In general, what do you think are the **primary goals** of any creek restoration? (rank below)

__ Improvement of **water quality**
__ **Flood control**
__ Improvement of **Aesthetics / Beauty** of the neighborhood
__ Rejuvenation of **native biology/landscape**
__ **Recreational** uses
__ **Educational** tool for learning about nature/environment

Other:

APPENDIX II.
STRAWBERRY CREEK RESTORATION LEADER SURVEY QUESTIONS

1. How and when did you **first become involved** in the Strawberry Creek restoration project?
2. Please describe your **role/involvement** in the Strawberry Creek restoration project.
3. In your opinion, has this project been a **success** so far? (choose one)

Y / N

Why or why not?

4. What were some of the **challenges** faced in this project?
5. Looking back on how things have gone, what would you have **done differently** (if anything)?
6. What has kept you **motivated and involved** in this project over time?
7. Please list some of the **pros and cons of the COLLABORATIVE** nature of this restoration (i.e. involving Berkeley High School students, undergrads, grads, faculty, staff, non-profit organizations etc.).
8. What are your **visions/hopes for the future** of this project?